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A CENTURY OF ACHIEVEMENT

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A Century of Achievement.

TO review in an hour the achievements of a century, and such a century as is now drawing to a close, is, it will be conceded, an impossible task. But among many characteristics that makes it stand out from its predecessors in the perspective of history, a few may be profitably singled out for consideration in the brief time at our disposal.

When the Nineteenth Century began, all Europe was involved in the turmoil of war. France was the centre of disturbance. Bonaparte, nominally first consul of a Republic, in reality wielding despotic authority, and already surrounded by much of the ceremonial of royalty, was the evil spirit of the storm, directing its devastating force hither and thither, as he willed. One nation alone stood out against him. It was in the first year of this century that Nelson turned his blind eye to the admiral's signal, and the decisive victory at Copenhagen, annihilating the naval power of Denmark, left England undisputed mistress of the seas, with a fleet the most powerful that the world had ever seen.

But the nations were tired of war and longed for the blessings of peace. The Peace of Lunéville in 1801 raised the Corsican adventurer to the pinnacle of glory. Then, although with a million fighting men at his disposal, he prepared for a time to win greater and more enduring victories than those of the battlefield.

With true statesmanship and characteristic energy and thoroughness, he devoted himself to the amelioration of social conditions of France—to the re-establishment of religion, to the unification and amendment of the laws, the education of the people, the promotion of trade and commerce. The destructive forces were to be curbed, and the task of building up was to be undertaken anew.

This constructive work of the great Napoleon proved in no small degree permanent. To reverse the hackneyed quotation, it sometimes happens that

> "The good that men do lives after them ;
> The evil is oft interred with their bones."

And not in France alone, but throughout all Europe, the improved national and social conditions existing to-day are in no small measure due to influences represented by the name of Napoleon. The leaven of the English and American Revolutions, after permeating all France, was carried by his armies to every part of the Continent. Liberty, Fraternity, Equality, became the political ideal of many of the best men, not only of thought but of action, in every land.

It was Napoleon's beneficent mission to sow broadcast over Europe the seeds of democracy, to modify the system of caste which permeated the strata of society, replacing it with the sense of brotherhood and human sympathy to fuse and blend and harmonize them, to shatter forever the idol worship of rank and place, to throw open to talent, however humble its origin, every public career, and while dealing the death blow to petty principalities that had survived the storms of centuries, to kindle, whether intentionally or as the consequence of his aggressive policy, a fervor of national sentiment in the masses of every European people. The Renaissance of the political life of Europe dates from the Napoleonic era. Its fuller development is represented in the socialistic tendencies of the age, and in national consolidation and expansion upon a scale never before known.

Early in the century Greece and Belgium were established as independent kingdoms. During our own time we have seen Savonarola's dream realized by the union of the divided and insignificant communities of Italy into one great kingdom by the efforts of Mazzini, Garibaldi, Victor Emanuel, and his astute minister Cavour ; the numerous petty German States consolidated into a mighty empire by Bismarck, Von Moltke, and William the First ; the Balkan Provinces liberated from the once powerful Turkish dominion, and established under independent or autonomous government ; Austria, detached from the German Confederation, deprived of her Italian Provinces, and compensated

by accessions of territory previously under Ottoman rule. The power of national sentiment as a cohesive force is felt in despotic Russia and Turkey, among the Slavs of the Danubian States, and the Greeks throughout the Levant.

Whilst the opposition of Western Europe has restrained Russia almost within her original European frontier, she has steadily and persistently reached out for province after province in Asia, until her territory practically borders on England's Indian Empire ; Afghanistan, Persia, Turkey and the Balkans are in the toils of her influence, and China has surrendered a large portion of her domain, including important ports on the Pacific, to her huge northern neighbor.

France, after passing through many phases of government, has for nearly thirty years maintained the Republic. In 1801 her territory extended to the Rhine. Shorn, since then, of her Rhine provinces, she has compensated herself by acquisitions in distant regions ; and Madagascar, a great part of Siam, Tonquin, and large blocks of Africa, are administered by her officials in the usual expensive and profitless manner of French colonies.

Germany also has become an African power, and strives against fate to imitate the success of Great Britain as a colonizer. She has possessed herself of vast sections of Africa and various smaller districts and islands in the Pacific.

Italy has shared in the colonizing tendency, although not with marked success. On the other hand, as the result of the recent war, Spain has withdrawn from America and the Phillipines, and practically ceased to be a colonial power. Her treatment of colonies has been bad from the beginning ; but such an event as the loss by the successors of Ferdinand and Charles V. of dependencies discovered by Columbus and Magellan, and subject to her uninterrupted sway, except for temporary periods during time of war, for four centuries, cannot but impress the imagination.

The spirit of expansion has permeated the farthest east.

The progress of Japan seems little short of miraculous. From a semi-barbarous condition, enforcing absolute non-intercourse with foreigners, the island empire has suddenly emerged into the full light of European civilization, and at one stride taken a recognized place as one of the great imperial

nations, the England of the East, strong in military and naval power, and in the intelligence of its people, with a parliament and free institutions, schools, colleges and universities. There has been an extraordinary development of manufactures, commerce, art, science and legislation, and of all the appliances of an advanced culture. Japan, too, has caught the colonial fever, and possesses as spoils of war the island of Formosa and a "sphere of influence," such as it is, in Corea.

The United States has vastly enlarged her area by the incorporation of Louisiana, Florida, Texas, New Mexico, California, Oregon, Alaska and the Sandwich Islands, Porto Rico and the Phillipines. She has extended her protectorate over "Cuba Libre." The Monroe Doctrine originated early in the century. The epoch-making departure from it, as one of the results of the Spanish war, marks the close of the same century. When the most colossal rebellion known to history threatened to destroy the work of Washington and the Fathers of the Republic, it was suppressed at the cost of the destruction and desolation of a four years' war, a million lives and thousands of millions of treasure. Slavery, the prime cause, having been abolished by a stroke of Lincoln's pen, the great commonwealth became socially and politically homogeneous. An expansion of trade, unparalleled in history, followed the settlement of the issues which had divided the nation and impeded its development. It would be strange indeed if Canada did not bear witness to the consolidating and colonizing tendency of the time. Canada, as a nation, is the product of this century. The year of the Queen's accession was, it is true, signalized in two of the provinces by uprisings of a section of the people against what they regarded as the domination of an oligarchy, which, having secured itself in the citadel of high office, had been able to defy the wishes of the majority. The Canadians sympathized largely with the principal objects of the insurrection ; but, whilst desiring British liberty, were attached, by instinct, tradition and reason, to the principle of a United Empire. They refused to approve of revolutionary methods, and the rebellion failed. The introduction of full responsible government by the Union Act of 1840 provided a remedy that proved to be ample for the evils complained of. Constitutional reforms, the establishment of educational and

municipal systems, railway construction, the abolition of ecclesiastical and seignorial privileges, and enhanced material prosperity followed. Then came further consolidation and expansion. The confederation of the provinces in 1867, and the subsequent acquisition of the North-West Territory, Prince Edward Island and British Columbia, have almost completed the territorial expansion of Canada. Newfoundland still remains outside, but the close of the century may yet witness her entrance into the Confederation. The Intercolonial and Canadian Pacific railways together form a highway from Halifax to Vancouver through a United British Dominion, now the most important link in the great chain of empire which encircles the globe. The Australian colonies are about to follow Canada's example, and it will perhaps not be long before the confederation of the South African provinces will also be accomplished. For their work in building up the great confederation of colonies, the names of Macdonald, Parkes and Rhodes will rank high in succeeding ages among the statesmen of the century.

The expansion of Britain has proceeded with a rapidity and energy which dazzles the imagination. Australia, New Zealand, Borneo, Afghanistan and Beloochistan, Fiji, New Guinea, Burmah, India, China, Africa, south, east, west, central and north, and the islands of every sea, are witnesses to the imperial tendencies of Great Britain, during the century now coming to a close.

"Till now the name of names, England, the name of might,
Flames from the Austral bounds to the ends of the northern night.

"And the call of her morning drum goes in a girdle of sound,
Like the voice of the sun in song, the great globe round and round.

"And the shadow of her flag, when it shouts to the northern breeze,
Floats from shore to shore of the universal seas.

"Who says that we shall pass, or the fame of us fade and die,
While the living stars fulfil their round in the living sky?"

This is the triumphal pæan of Imperialism, and Imperialism is the dominant note of the closing years of the nineteenth century. The sentiment is not confined to people of British allegiance, but has become a guiding impulse of all the influential races of mankind. But empire has its responsibilities and its

conditions of permanence. How can these be better expressed than in the lines of the uncrowned laureate of the Seven Seas?

"Fair is our lot—O goodly is our heritage!
(Humble ye, my people, and be fearful in your mirth!)
For the Lord our God Most High
He hath made the deep as dry,
He hath smote for us a pathway to the ends of all the earth!

"Hold ye the Faith—the Faith our fathers sealed us;
Toying not with visions—over-wise and over-stale.
Except ye pay the Lord,
Single heart and single sword,
Of your children in their bondage shall He ask them treble tale!

"Keep ye the law—be swift in all obedience—
Clear the land of evil, drive the road and bridge the ford,
Make ye sure to each his own,
That he reap where he hath sown,
By the peace among our peoples let men know we serve the Lord!"

And after all, this "Pax Britannica" is the greatest triumph of British, as the "Pax Romana" was of Roman Imperialism; for it means, that wherever "on the bones of the English, the English flag is stayed," the forces of darkness, of ignorance, of barbarism, are put to flight; that right is henceforth might; that the majesty of imperial law takes the place of violence, injustice and oppression; that peace and good-will, plenty and happiness, all that follows in the train of Christian civilization, shall finally some day succeed to hate and cruelty, war and famine upon the earth.

This is the ultimate reason and justification for that restless instinct that sends the pioneer across unknown seas and pathless continents, as discoverer, explorer, trader, missionary, settler. That unconquerable yearning is the true secret and sanction of the expansion of England. Danger, disaster, death itself, are powerless to quench it. It is a sign of a nation's vitality, and its absence is a proof of decay. Whitman, the good gray poet of democracy, asks:

"Have the elder races halted?
Do they droop and end their lesson, wearied, over there beyond the seas?
We take up the task eternal, and the burden and the lesson,
Pioneers! Oh, Pioneers!"

And now the "white man's burden" has descended, with all its weight, upon the shoulders of the neighboring republic, in a manner that Whitman never dreamed of.

No writer has felt the pulse of Imperial Britain with so true a touch or read its meaning with so clear an insight as Kipling. Hear him once more:

"We were dreamers, dreaming greatly, in the man-stifled town;
We yearned beyond the sky-line, where the strange roads go down.
Came the Whisper, came the Vision, came the Power with the Need,
Till the Soul that is not man's Soul was lent us to lead.
As the deer breaks—as the steer breaks—from the herd where they graze,
In the faith of little children we went on our ways.
Then the wood failed—then the food failed—then the last water dried;
In the faith of little children we lay down and died.
On the sand-drift—on the veldt-side—in the fern scrub we lay,
That our sons might follow after by the bones on the way.
Follow after—follow after! We have watered the root,
And the bud has come to blossom that ripens for fruit.
Follow after—we are waiting, by the trails that we lost,
For the sounds of many footsteps, for the tread of a host.
Follow after—follow after—for the harvest is sown;
By the bones about the way-side, ye shall come to your own!"

And yet, it may be said, that but for the triumphs of science in this 19th century, the permanence of British sway would be by no means as assured as it now appears. World-wide as the Empire has become, its scattered members are nearer together for purposes of administration and defence than were the various portions of the little island kingdom a century ago.

In older times it was thought that the sea was, by God's special ordinance, established to prevent intercourse of nations, and that

"Mountains interposed
Make enemies of nations, which had else
Like kindred drops been mingled into one."

Now the granite is pierced by tunnels, and a railway journey of a few minutes renders communication easy between mountain districts, which half a century ago would have remained in almost total ignorance of each other.

Steam power and electricity have annihilated distance. The whole world can be compassed by a traveller to-day in but little

more than the time an immigrant required thirty or forty years ago to drive his ox-cart from St. Paul to Winnipeg. Puck boasted that he could put a girdle round about the earth in forty minutes. Morse and Cyrus Field have successfully met his challenge during this century. The electric current is made to flash the events of every day to the remotest corner of the world in a few seconds.

The machinery of government has been simplified, and its efficiency and rapidity enormously increased by these achievements of science. Instead of the sea being, as Horace deemed it, the great separator of nations, it is now the great bond of union and solidarity of the British Empire, its chief ally and protector against hostile combinations. Without her maritime supremacy where, we may well ask, would be England's power and prestige and enormous wealth? In her case, indeed, the ocean was the highway to empire, and it is now the principal security for its maintenance. In a larger sense than Campbell imagined, it may now be said,—

> "Britannia needs no bulwarks,
> No towers along the steep;
> Her march is o'er the mountain waves,
> Her home is on the deep."

The United Empire Loyalists builded better than they knew. The principle for which they sacrificed home and property, the friends and associations of a lifetime, is at last recognized by men like Admiral Dewey, as the best existing security for the peace of the world. No one now advocates the severance of the colonies from the Empire. All are agreed as to the duty and the necessity of Britain's maintenance of her supremacy as a sea-power. For the forces of envy, of hate, of jealousy, have been and will doubtless again be combined against her. In recent years it seemed as if once more, as of old, she would be compelled to front the world in arms. But through rifted clouds and above the storms that threatened to overwhelm, gleamed ever the star of Empire; and it shines always with renewed lustre, when, surrounded by her foes,

> "She lays her hand upon her sword,
> And turns her eyes toward the sea."

But not only has the spirit of the age made the great powers cosmopolitan. It has changed the entire basis of society. The divine right of kings still exists in Germany and Russia. The western world has replaced it with the divine right of the people. Instead of poising in an inverted position upon its apex, as was supposed to be the ordinance of the Almighty, the social pyramid now rests "broad-based upon the people's right." Popular rule has its disadvantages and its dangers ; but with all its faults, it has at least always aimed at basing legislation and government upon principles of justice, honor and mercy, to an extent that was unknown, when the few had power and used it for their own purposes. In large measure, the voice of the people has proved itself to be the voice of God.

Amongst sovereign states, democratic Britain led the way in the abolition of the slave trade early in the century. Ontario had put an end to the institution of slavery by legislation before the century began. Then the national conscience of Britain refused to be satisfied with less than the abolition of slavery throughout the Empire, and the effectual suppression of the slave trade throughout the world. The trade has long since been destroyed upon the sea ; and, except in certain parts of Africa, it has practically ceased to exist upon the land.

The extinction of slavery in the British Empire was followed in the United States by the struggle against its extension to the territories, the great rebellion which resulted from the rapid progress of the abolition movement, Lincoln's proclamation emancipating the millions of slaves in the Southern Confederacy, and the constitutional amendment which forever excluded the obnoxious institution from the Union.

The mind and conscience of foreign rulers were stirred by these examples, and by the exercise of their autocratic authority, the Czar Alexander and the cultured and great-hearted Emperor of Brazil, Dom Pedro, successfully put an end to serfdom in Russia and negro slavery in Brazil. The nineteenth century blotted out slavery from the civilized world.

The growth of democracy, however, was accompanied by many other great reforms, such as wider freedom of trade ; the more equal distribution of taxation according to wealth ; the abolition of capital punishment except for the gravest offenses ;

acts for the emancipation of women and the protection of children ; the repeal of outworn laws in restraint of combinations of workmen ; the reform of prisons ; the establishment of hospitals and asylums for the infirm in body or mind ; their administration upon more humane and scientific principles ; and the more stringent regulations and even partial suppression of the traffic in intoxicating liquors. When we consider the great and powerful organizations, national and international, now in active operation, for the promotion of the interests of employees, it is difficult to believe that within the lifetime of this generation it was in Canada a criminal offence for working men to combine effectively for mutual advantage.

Government based on popular franchise involves, as a necessary corollary, popular education. The reign of Victoria has accordingly witnessed the establishment of mechanics' and farmers' institutes ; industrial, technical, and night schools ; free schools ; free public libraries, and compulsory education for both sexes.

Intimately connected with these educational advantages may be mentioned the use of postage stamps, begun by England in 1840, and afterwards adopted by every civilized nation ; the enormous reduction in the rates of inland and foreign postage, culminating, through the recent action of Canada, in penny postage throughout the greater part of the empire ; the cheap newspaper, book and parcel post ; the registered letter, money order and postal note system ; the introduction of the postal card, and one of the century's mightiest achievements, that extraordinary and world-wide system known as the Universal Postal Union, now at length embracing nations representing a thousand millions of mankind.

The century is remarkable for the growth of universities. Even when Queen Victoria ascended the throne, there was not a university in all British North America in actual operation, except McGill. The commencement of the University of Toronto, under its former name of King's College, when its first students were enrolled, took place on the 8th day of June, 1843, six years after the Queen's accession. Victoria College obtained authority to confer degrees in 1841. In the same year Queen's obtained its charter from the Imperial Government. The other

universities are of later date: Trinity, Western, McMaster, Regiopolis and Ottawa, in Ontario. Time will not permit me to speak of the excellent universities of the other provinces of the Dominion. The universal instinct for consolidation and expansion has affected our great educational institutions. The University of Toronto has gathered about it a number of affiliated colleges, and federated with Victoria University. Trinity, McGill and Manitoba have also their affiliated colleges. The provincial educational system of Ontario includes practically in one organism kindergartens and public schools, collegiate institutes and the universities.

All these academic institutions are doing most valualbe work in the upbuilding of the Canadian nation, and all are the growth of the 19th century.

The century now closing has witnessed vast increases in the number and equipment of great universities and colleges in Great Britain and Ireland, in all the dependencies of the Empire and in foreign countries.

Most noteworthy, perhaps, is the great Imperial University of Tokio, the growth of a day, as it were. Amongst the fairy tales of private munificence may be mentioned the establishment of colossal institutions of learning, like Cornell University, Johns Hopkins at Baltimore, Leland Stanford in California, and Rockefeller's creation, the University of Chicago, springing into existence as by the touch of Aladdin, and at once taking rank with great universities of other lands, the slow growth of centuries.

The magnificent donations of McDonald, Lord Strathcona, and others, to McGill; the bequests of William Gooderham and Hart A. Massey to Victoria; the gifts to the University of Toronto by Blake, Mulock and others, and the endowments of Trinity, Queen's and McMaster Universities, and Knox and Moulton colleges, make a good beginning of similar donations in our own Dominion

More than ten millions of dollars was added to the wealth of universities in the United States alone during the year just closed. Nothing has been known in past ages to compare with it, and, if there were nothing else by which it should be remembered, the Victorian age would be forever memorable for

its extraordinary development of universities and other institutions for the promotion of learning and science.

Popular government postulates liberty of speech and of the press; and the evolution of the newspaper, the magazine and the review, has kept pace with the other great movements of the age. Consider, for a moment, that so lately as the year of the Queen's accession to the throne, there was not an illustrated journal in the world, not a daily paper in England outside of London, not one in her colonial possessions, hardly a religious newspaper in the world; that such a thing as a monthly magazine was almost, if not altogether, unknown; that the electric telegraph had not been invented, nor the steam press, nor the art of reproducing pictures by photogravure or other modern processes.

You can then form some idea of the difference between the social and intellectual atmosphere of that epoch and this, in which every house takes in its daily and weekly papers, and its monthly magazines, secular, religious, scientific or philosophic, filled with artistic illustrations of great excellence; but it will still be impossible to realize it in its fullness, or to imagine our grandfathers' necessarily narrow outlook upon life. In our modes of life and thought we are separated from them, not by half a century, but by a thousand years.

When we consider the achievements of the century in science and invention, the memory and the imagination become bewildered and intoxicated.

In the earlier half of the century there were no reaping nor mowing machines, no self-binders, no drills nor horse-rakes, none of the machinery now in ordinary use upon farms. In England, until quite recently, if indeed the practice does not continue to this day, grain was cut with a sickle, bound by hand with a wisp of straw, and threshed with a flail. American inventiveness early substituted the cradle for the sickle. The lost Roman art of tile draining was just coming again into use when the Queen ascended the throne. In domestic economy the sewing machine had not been heard of, nor the carpet sweeper, the washing machine, the rotary churn, nor the creamery. Flint and tinder were necessities in most houses for lighting fires. Candles were employed for illuminating purposes—tallow or

wax, according to the need of economy. Shops and larger buildings were lighted with whale oil. Coal oil, as an illuminant, is of recent introduction. The electric light is of yesterday. Acetylene and the Auer mantle are just coming into general adoption. Lucifer matches are inventions of this century.

In the matter of locomotion, whilst steamers and railways began to be known early in the century, the later developments have left Fulton and Stephenson far behind. The invention of the screw propeller, of iron plating for ships, the marvellous extension of light houses and fog signals, the use of revolving lights, the construction of floating palaces of 17,000 tons, the perfection of railway road-beds, the express steamer, the lightning express train, the use of the telegraph and cable in connection with train and steamboat service, the improvement of highways, steel bridges, the bicycle, the steam and electric motor—these are all later innovations, adding to the rapidity, the comfort or the safety of travel, to a degree unimagined even a generation ago.

In our houses and offices the telephone, first publicly exhibited in 1876, has become a necessity.

The phonograph surpasses, in actual every day life, Baron Munchausen's story of the frozen words dropped from the mouths of arctic travellers, and afterwards picked up, thawe out and reproduced by later visitors. Edison would have been burned as a wizard a few centuries ago. His later invention reproduces by telegraph one's actual handwriting a thousand miles away. The cinematograph parallels with its realities the wildest dream of the Arabian Nights. The poet of the earlier 40's,

> "Nourishing a youth sublime
> With the fairy tales of science and the long results of time,"

must have been, at least, startled by the rapid and miraculous realization of his day dreams when he looked back upon them "sixty years after."

Military and naval science have been revolutionized. Mere muscle and brute courage have been relegated to a subordinate place. The battles of the future are to be contests of science, of wealth, of cool heads rather than fiery hearts and brawn

muscles. VonMoltke sits in his office and plans the campaign in every detail. Wolseley predicts the day of his triumphal entrance into Cairo. To the trained strategist, with the resources of wealth and science at his disposal, the end is known from the beginning. The moves are predetermined and follow each other like those of a game of skill. Overwhelming forces concentrate round the enemy ; the heights swarm with artillery ; railways are extemporized to transport armies with their munitions and supplies. The nation that is not up to date in military science and equipment is lost. The result is Sedan, Manilla, Santiago, Omdurman—not a battle, but a slaughter. There is but one issue to such a contest. With the powerful aid of the almighty dollar, science, genius and intellect triumph henceforth in the warfare of nations.

In the Napoleonic wars and our own war of 1812, men fought with flint locks and on wooden ships. During the last generation the navies of the world have been replaced with steel-armoured ships, whilst nickel-plate is beginning to be employed. Explosives of immense destructiveness have come into general use. The range of artillery has increased to 10 or 12 miles or more. Torpedoes and torpedo destroyers are of very recent invention. Search lights bewilder the enemy and expose them to destruction by night as by day. Gatling, Hotchkiss and Maxim's inventions enable one man, by the pressure of a button, to destroy a regiment in a few minutes with a continuous hail of bullets from a simple machine. Old fortifications are worthless to-day. Infantry rifles will kill at two miles. All the conditions of warfare are changed. Terrible beyond conception will be the next war between great military or naval powers. The terrors and the uncertainty of warfare under such conditions are a mighty factor in the preservation of the peace of the world.

Turning from these nightmare dreams to more peaceful aspects of science, we find that the century has witnessed the rise of sciences previously unknown, and the revival of others in new forms so as to be practically new sciences.

I can only mention in passing the advances made in chemistry, astronomy, microscopy, acoustics ; the transformation of electricity from the amusing-experiment stage to that of a

science of amazing and transcendent importance ; the birth of the science of bacteriology, the growth of anthropology, with its kindred or subordinate sciences of archæology, craniology, ethnography, and comparative philology. Electricity as a modern science dates from the Centennial Exhibition of 1876. It has necessitated in its practical operation such additions to the English language, that at the time of publication of one of the recent dictionaries 8000 new words belonging to this science alone had to be included.

Science in general may be said to have been revolutionized during the last half of the century. The whole field of antecedent science is but a sand-heap in value compared with the vast domain conquered by the researches of Lyell, Darwin, Tyndall, Huxley, Spencer, Haeckel, Brewster, Koch, Pasteur, Roux, Lister, Koller, Kelvin, Maxwell, Edison, Bell, Kitasato, Roentgen, and others, during the reign of Queen Victoria.

The doctrine of evolution, spectrum analysis, the conservation of energy, the germ theory, the function of the white corpuscles in the blood, the X rays, belong to the Victorian era, and distinguish it from all that have preceded it. The discovery of anæsthetics belongs to this era. Chloroform, ether and cocaine, have taken away the terrors, and the employment of antiseptics, and, later, the adoption of aseptic surgery, has destroyed the dangers, of surgical operations.

Listerism, it would perhaps not be too much to say, surpasses in importance all previous discoveries in medical science.

It is pathetic and almost incredible, in these days, to read Lord Lister's statement that in his earlier years, Mr. Sime, the safest surgeon of the day, was of the opinion, on the whole, that in all cases of compound fracture of the leg, the wise course was to amputate the limb without attempting to save it. Surgical operations were fatal in very many cases. To-day in every hospital in the world operations are performed with almost uniform success, which until Lister's discovery, no surgeon would have dared to attempt ; or if he had, the patient would have died as the result. It has been asserted that more lives have already been saved during the last quarter of a century through antiseptic and aseptic surgery, than have been lost in battle in all the wars of the century. Amongst the benefactors of the

human race, through all the centuries, whom shall we compare with this man ?

In the domain of literature the century will bear comparison with any past age.

In poetry, the great names of Wordsworth, Keats, Byron, Shelley, Scott, Tennyson, Browning, Fitzgerald, Matthew Arnold, Swinburne, Morris, Rossetti, Watson and Kipling, in England ; Bryant, Longfellow, Poe, Lowell, Whittier, Emerson, Holmes, Whitman, Aldrich, in the United States ; Hugo and Alfred de Musset, in France ; Goethe, Schiller, Heine, in Germany ; Leopardi, in Italy—would confer distinction upon any epoch.

Canada, too, has its singers, and William Kirby, Roberts, Mair, Valancey Crawford, Lampman (whose recent death we lament), Bliss Carman, Wilfred Campbell, Duncan Cameron Scott, Drummond, Bengough, Pauline Johnson, Fréchette, Jean Blewett, are names of which we may well be proud.

Macaulay made history interesting. It has become a new science in the 19th century. We can only mention a few names : Macaulay, Carlyle, Grote, Buckle, Froude, Guizot, Michelet, Duruy, Lecky, Freeman, Bancroft, Parkman, Motley, John Fiske, John Richard Green, Justin McCarthy. In Canada we have Garneau, Scadding, McMullen, Kingsford, Brymner, Sulte, Casgrain, Bourinot.

In fiction, the novel is a 19th century product. The Wizard of the North still outranks his successors. But the art has reached a wide and wonderful development since his death, in 1831. It is only needful to name the following, as among the many representatives of the Victorian era : Dickens, Thackeray, Bulwer-Lytton, George Eliot, Lever, Lover, the Brontes, Charles Reade, Wilkie Collins, Stevenson, Barrie, Mrs. Steele, Ian McLaren, Mrs. Humphrey Ward, Hall Caine, Kipling, in Great Britain ; Balzac, Dumas, Hugo, Flaubert, Daudet, Maupassant, Zola, in France ; Manzoni, in Italy ; Tolstoi, Turguenieff, Pushkin, in Russia ; Sinkiewicz, in Poland ; Emil Franzos, in Galicia ; Jokai, in Hungary ; Bjornsen, in Norway ; Cooper, Irving, Harriet Beecher Stowe, Holmes, Mark Twain, Bret Harte, Charles Egbert Craddock, Dr. Weir Mitchell, James Lane Allen, in the United States ; William Kirby, Robert Barr,

Gilbert Parker, Roberts, E. W. Thomson, Joanna Wood, Jean McIlwraith, Wm. McLennan, and Drummond, in Canada, where the rich mine of history and tradition relating to the French régime has begun to be worked with most satisfactory results.

In the domain of art are such names as Constable, Turner, Landseer, Leighton, Doré, Millais, Lady Butler, George Frederick Watts, Holman Hunt, Whistler, in Great Britain ; Jean François Millet, Gérôme, Meissonnier, Rosa Bonheur, Bouguereau, Tissot, in France ; Bierstadt, Church, Sergeant, Marx, Kenyon Cox, in the United States ; Israels, in Holland. Germany, Sweden, Spain and Italy have a splendid record for the century. Russia startled the visitors to the World's Fair by the power displayed by its artists of to-day. Canada need not be ashamed of Berthon, Jacobi, Forbes, O'Brien, Wyatt Eaton, Reid, Wylie Greer, Brymner, Patterson, Bell-Smith, Atkinson, William Smith, Forster, or Mrs. Schreiber. Ruskin's rank and precedence as an expounder of art, its critic and interpreter, are undisputed.

Music is represented by such names as Beethoven, Rossini, Verdi, Gounod, Balfe, Schumann, Schubert, Mendelssohn, Wagner, Liszt, Rubinstein, Mascagni, Svorak ; the concert platform, dramatic and operatic stage, by Irving, Terry, Kean, Booth, Jefferson, Lawrence and Wilson Barrett, Rossi, Salvini, Jenny Lind, Adelaide Neilson, Modjeska, Janauschek, Nilsson, Tietijens, Materna, Patti, Trebelli, Bernhardt, Agar, Got, Plançon, Sembrich, Sarasate, Nordica, Melba, and our own Canadian Albani, Julia Arthur and Franklin McLeay.

In oratory there are the names of Gladstone, Disraeli, Bright, Webster, Castelar, Spurgeon, Punshon, Simpson, Phillips, Hyacinthe, Brooks; and in Canada, Howe, McGee and Chapleau, besides a number of distinguished speakers amongst those of our own day.

If we leave out of view Columbus's achievement, no previous century can show such a record as our own in regard to the discovery, exploration and opening for settlement of vast unknown regions. By the side of the great and daring discoverers of the past may be placed, without disparagement, such men as Moffatt, Livingstone, Stanley, Emin Pasha, Speke, Grant, Baker, Barth, Schweinfurth, Karl Peters, Marchand, in Africa ; Burnaby, Kennin, Sven Edin and Landor, in Asia ; and on our own continent, Lewis and Clark, Sir Geo. Simpson,

Douglas, Evans, George and John Macdougall, Petitot, Lacombe, Ogilvie, Bell and Tyrrell. In Arctic and Antarctic discovery we have Franklin, Kane, McClintock, Ross, Greeley, Nansen, Peary.

I am only too conscious of the utter inadequacy of these catalogues to convey any fair idea of the achievement of the century. In philosophy and theological and biblical learning and exposition, what century can compare with ours ?

On account of the limited time at my disposal, whole classes of subjects have been omitted from the list. To those included, many names might be added worthy to be placed in the same category. We may, however, venture to sum up the general result in a few words. It is true that former ages produced immortal names, whose supremacy none can question—such names as Homer, Plato, Demosthenes, Virgil, Dante, Shakespeare, Milton, Bacon, Newton ; but, taking the century's production as a whole, and with due regard to the great masters of old, it may be asserted, with some degree of confidence, that no preceding age has surpassed, if it has equalled, the 19th century in the departments of literature, painting and music. Never, moreover, have the fruits of civilization been brought within the reach of so large a proportion of the human race. Never has the gospel of altruism or practical Christianity been preached and practised more earnestly, more effectually, or over anything like so wide an area ; and although many are disposed to pessimistic views, there are ample grounds for affirming that the mental, moral and religious outlook has never been so bright, so clear, so full of hope for the future, as in these closing years of the century. Perhaps it may be profitable to dwell for a little upon this feature of our subject.

It is nearly three hundred years since Bacon suggested the modern scientific method of investigation and reasoning. Its greatest triumph was reserved for our own day, under the banner of Darwin, his co-workers and successors. At the present time, the doctrine of evolution dominates every system of thought and every phase of inquiry. It has included the entire circle of knowledge in its all-embracing sway—not merely biology in all its departments, but astronomy, philosophy, philology, history and jurisprudence.

Theology and religion itself, to some extent at least, have acknowledged the universality of its influence. The fact must be admitted, whether we approve or not. Comparative theology and comparative religion and folk-lore are new departments of systematized knowledge, treated from the scientific and historical standpoint, and by the inductive process of reasoning. So indeed are cosmogony and teleology. The long warfare between religion and science has not been closed, it is true; but there are indications of a common standing ground, of at least a *modus vivendi*. A basis of armistice may be found. There are reasonable grounds for predicting that, in the not distant future, religion and science as allies, not enemies, each supplementing and inspiring the other with its special revelations of the everlasting purpose of the Creator, will march together side by side to encounter and overthrow the hosts of ignorance, superstition and evil. That common standing ground is Evolution, which John Fiske has so tersely and aptly described as being merely "God's way of doing things."

Philosophers tell us that, besides our ordinary consciousness, our lives are largely controlled or influenced by what they call sub-consciousness, acting as far as appears automatically and independently of conscious effort on our part. The problem that appeared so difficult at night has solved itself by the morning, we know not how: for we slept through the process. And there is a sub-consciousness of nations. The spirit of the age differs essentially from generation to generation. We feel it, like the wind, but know not whence it cometh or whither it goeth. Questions insoluble to-day in the minds of the profoundest thinkers are to-morrow settled and clear to the untrained intellects of the masses. The intellectual atmosphere, the language itself, changes; new forms of speech and thought come into use; old thoughts assume meanings undreamed of by our fathers; words and the ideas they strive to represent act and react upon each other;

> "Nothing of them that doth fade
> Both doth suffer a sea-change
> Into something rich and strange."

In a few years the entire civilized human race becomes suddenly aware, without having been conscious of the process, that its

outlook upon life is essentially and widely different from that of the former time ; its ideas of life and death, of time and eternity, of space and infinity, of duty and responsibility, have been revolutionized, and solutions of the profoundest problems of human thought accepted universally, which had been, by the experts of the former time, rejected with contumely and contempt.

The general route of the voyage of mankind across the pathless ocean from the old to the new world of thought may be indicated by a few landmarks. We talk knowingly of the causes of modern civilization, and we catalogue the fall of Constantinople, the Renaissance, the Reformation, the Council of Trent, the discovery of America and the route to the Indies, Bacon's Novum Organum, the English, American and French Revolutions, Napoleon's wars, reform and education bills, the expansion of the Empire, the confederation and consolidation of states, trades' unions, socialism, modern science, atomic and germ theories, Darwinism and other great facts of history, as explaining its origin. They accentuate, illustrate and describe its course, but only in a very limited sense do they explain it. The spirit of the age carries mankind along in its predestined course in spite of wind and rudder. A nation suddenly awakes to the fact that it has been born again. That is the meaning of the word Renaissance, and it may be appropriately applied to the new phase of human thought which renders the Victorian era one of the great landmarks of history.

The immensity of the stellar universe is in these later days revealed by telescopes, powerful beyond the imagination of former ages, stationed on prairies or mountain tops by them undreamed of. Along with the infinite vastness is revealed the infinite divisibility and minuteness of space, matter and life, now at length made known by the progress of microscopic investigation. The outlook upon creation is enlarged. The mind strives to grasp at once the infinitely great and the infinitely little—the atom and the universe. And now we know as never before, that there is no great and no small ; for the small is infinitely great, and the great is infinitely small.

The sciences of archæology and geology are the creation of this century. They have come as special revelations of God to dispel clouds of ignorance that have long hung like a pall over the

human intellect, obscured its vision and misled its thought and action. The testimony of the rocks has carried the history of life upon this planet back through countless ages. Clay tablets unearthed in the Euphrates valley extend the written history of life to a period six or seven thousand years before the Christian era. Even in that early period, we find man divided into organized nationalities, and provided with customs, systems of government and appliances of civilization, which necessitate a long previous history of development, involving a long series of ages; and ancient memorials even then existed of æons long anterior, in the form of great cities and temples, and old traditions. The investigations of Layard and Rawlinson, Burgsch and Maspero, Palmer and Sayce, Schliemann, and the various Exploration Funds, have furnished overwhelming evidences of the immensity of time required for the full development of man upon this planet; and old established misinterpretations of sacred and other historical records have vanished before them like mist before the sun.

The study of primitive races in their various stages of savagery and barbarism has led to the fascinating sciences of comparative mythology and folk-lore and comparative religion, and we are enabled to trace in some measure the successive steps by which the idea of man's relation to the Infinite has been evolved by progressive revelations from the crudest pantheism and fetichism to the purest monotheism.

Reverent and learned scholars, imbued with the age's inquisitive spirit, have studied the sacred Scriptures themselves with a zeal and insight and intensity never before known. They have investigated with vast research and erudition the development of the human agency in their composition. Illustrative facts have been collected from many nations and kindreds and tongues; words and phrases have been carefully collated and critically examined, the styles of writers and dialects and periods of time distinguished and characterized, archæological remains have been unearthed as if by miracle at opportune moments, to disprove or confirm theories, and the result is one of the crowning achievements of the century, in the domain of Biblical learning. Many mistakes have been and will be made by higher critics, as by evolutionists, working hypotheses must be

readjusted to harmonize with wider knowledge; but the rapidity with which the world's mind has adapted itself to new ideas and new revelations is shown by the changed attitude, during the last ten or fifteen years, of the religious world to these new phases of thought. By an almost unconscious process, men of the most intense convictions find themselves accepting as of course new principles of interpretation and new methods of historical research, whose expounders they ostracised a decade ago; and in the opinion of many leaders of thought the Higher Criticism is as firmly established as a general principle of investigation and aid to interpretation of Biblical records as evolution is accepted as a general working theory of the progressive creation by its Divine Author of the universe, and all it contains.

And again, as in days of old, men hasten to build the tombs the prophets whom they stoned.

Tennyson, contemplating two generations ago the conflict between religion and science, saw with prophetic vision the "long result of time." In his prayer we may join, with hope and confidence of its progressive realization :

> "Let knowledge grow from more to more,
> But more of reverence in us dwell;
> That mind and soul according well
> May make one music as before,
> But vaster."

The wider outlook, the more open mind, the deeper insight, the broader sympathy, the more earnest reaching after truth; these, in their influence upon both the present and future of mankind, are—shall we say it?—the sum of the achievement of the 19th century, and it is in its nature essentially religious.

The religious, like the scientific, thought of the future will be widened with the process of the suns. The stars in their courses fight for the newer learning. There can be no real warfare between the revelation of God's footprints on the rock and in the stars, and the true interpretation of revelation in the written word. Their harmony entered into the soul of the Psalmist of old, and has been caught by the attentive ears of the poets of every land. It must ever appear more and more

clearly to each succeeding age, until in fullest splendor it is revealed to

> "The crowning race,
> Of those that eye to eye shall look
> On knowledge; under whose command
> Is Earth and Earth's, and in their hand
> Is Nature like an open book."

JAMES H. COYNE.

St. Thomas, Ont.

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